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ABSTRACT

The report prepared for the Five Associated University Libraries (FAUL) by the Technical Information Dissemination Bureau (TIDB) at Suny-Buffalo is divided into nine sections: (1) a summary of procedures used to accomplish the specified MASFILE-II tasks; (2) a graphic comparison of the MARC-II and the MASFILE-II formats; (3) recommend modifications to the FAUL MASFILE-II record needed to transmit records from the MASFILE computer to local terminals or line printers in the MARC-II format; (4) recommend data elements which must be resident in a MASFILE-II record to produce products as specified by the FAUL Systems Committee; (5) recommend workable procedures for each FAUL Library to modify MASFILE-II records in a central computer on a routine basis; (6) recommend workable procedures for adding current local records into MASFILE; (7) recommend workable methods for identifying and selecting specific records and groups of records from MASFILE to produce lists organized by subject, class number, or main entry; (8) isolate major problem areas resulting from this project and (9) summarize time spent and activities performed in computer testing, program runs, clerical operations, and professional time. (MASFILE-I Pilot Project is available as ED 028 801). (Author/NH)

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MASFILE SERIES
MF 15.6

MASFILE-II PILOT PROJECT

FINAL REPORT

submitted to the
Board of Directors
Five Associated University Libraries

by the
Technical Information Dissemination Bureau
State University of New York at Buffalo

JUNE 1970

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1.0 INTRODUCTION

In response to a request from the Five Associated University Libraries (FAUL), the Technical Information Dissemination Bureau (TIDB) at SUNY-Buffalo undertook project MASFILE-II. The tasks specified in the FAUL Work Statement (section II.I) were undertaken. As part of the project, TIDB was directed by FAUL to prepare a report which would include:

1. A summary of procedures used to accomplish the specified MASFILE-II tasks.

2. A graphic comparison of the MARC-II format and the MASFILE-II format.

3. Recommend modifications to the FAUL MASFILE-II record needed to transmit records (by magnetic tape or by IBM 2741 communications terminals) from the MASFILE computer to local terminals or line printers in the MARC-II format.

4. Recommend data elements which must be resident in a MASFILE-II record to produce products as specified by the FAUL Systems Committee.

5. Recommend workable procedures for each FAUL Library to modify MASFILE-II records in a central computer on a routine basis which have been input from either the MARC Tape Distribution Service or from local cataloging systems.

6. Recommend workable procedures for adding current local records into MASFILE.

7. Recommend workable methods for identifying and selecting specific records and groups of records from MASFILE to produce lists organized by subject, class number, or main entry.

8. Isolate major problem areas resulting from this project which FAUL library staff members, committees or contractors should solve.

9. Summarize time spent and activities performed in computer testing, program runs, clerical operations, and professional time.

This report is divided into 9 Sections, each dealing with one of the above areas.

2.0 A SUMMARY OF PROCEDURES USED TO ACCOMPLISH MASFILE-II TASKS

2.1 Task 1. Convert MASFILE-I Records to MASFILE-II Format

Records produced during the MASFILE-I project [1,2,3/] were previously stored on magnetic tape in the SUNYAB master file format. Since the SUNYAB master file format is a modified MARC-I format, conversion to the MASFILE-II format (essentially a MARC-II format) could not be performed by computer alone. The SUNYAB master file format contains less detail than the MARC II format. Because of this, appropriate bibliographic items require human modification of certain tagged fields in order to transform them into the MARC-II format.

In order to accomplish this task, a computer program (P-1)[4/] was written which converted MASFILE-I tags to the most probable MARC-II tags and then formatted the data into the IBM Administrative Terminal System (ATS) format. A computer listing of the converted file was printed (P-2) and used by an editor to correct tags, delimiters and indicators, then the file was loaded into ATS (P-3). After correction, the ATS file was transferred to magnetic tape (P-4) and reformatted into the MASFILE-II format (P-5). About 1,800 records were converted in this manner.

2.2 Task 2. Extraction of Marc II Z Class Records

A computer program was written (P-6) and used to search 21,480 MARC-II records for those records in the Library of congress Z Class. As a result, 528 records were extracted. Each record was then converted from the MARC-II format to the MASFILE-II format (P-6). This task merely involved moving the LC card number tagged field. A MASFILE-II control number was then inserted in the control number portion of the MARC-II record.

1/ Masfile-I Pilot Project Final Report, April 11, 1969 (available from the ERIC Document Reproduction Service as ED-028 801).

2/ An Experimental Holdings List of Selected Research Monographs in the Five Associated University Libraries: Book Trade and Library Service. January 1969.

3/ Same, in microfiche form

4/ Computer programs are indicated by program numbers beginning with the letter P. A list of programs used for the MASFILE-II Pilot Project is in Section II.3.

2.3 *Task 3. Extraction and Listing of Z Class SUNYAB Records*

A computer program program was written (P-7) and used to extract all Z Class entries which had been added to the SUNYAB master file between September 1, 1965 - July 1, 1969. Z Class records were stored on magnetic tape (P-7). These records were then passed through a SUNYAB program (P-8) which generated a main entry filing field. The file was then sorted on this field (P-9) and on the extant title/main-entry fields in the records according to a main-entry filing program (P-10). A listing of 581 records was printed (P-11) and sent to the Cornell University Library.

2.4 *Task 4. Cornell Updating of SUNYAB Records*

Cornell holdings information was added manually to each of the records on the list produced as described in Section 2.3 above. The list was then returned to TIDB by Cornell.

2.5 *Task 5. Addition of Cornell Holdings to Extracted SUNYAB Z Class Records*

The computer program used to convert MASFILE-I records (P-1) to the MASFILE-II format (Task 1) was modified and used to convert the Task 3 records to a close approximation of the MARC-II tagging scheme. These records were converted to the ATS format and loaded into ATS. Again an editor corrected tags, delimiters and indicators. A typist corrected the records using ATS and added the appropriate Cornell holdings statements. These records were transferred to magnetic tape (P-4) and formatted into the MASFILE-II format using the program described in Section 2.1 (P-5).

2.6 *Task 6. Conversion of SUNYAB Z Class Cataloged Items*

Upon receipt of FAUL Cataloging Worksheets from SUNYAB, containing Z class records of items cataloged from July 1, 1969 - September 31, 1969, the records were entered on ATS, proofread and corrected. Special coding was required for certain diacritical marks. This diacritical coding is described in Section II.2. These records were transferred to magnetic tape (P-4) and formatted into the MASFILE-II format (P-5).

2.7 *Tasks 7 and 8. Conversion of Cornell Z Class Cataloged Items*

The procedure for these tasks is identical to that described in Section 2.6; the Z class items from Cornell were cataloged during the period July 1, 1969 through September 31, 1969.

2.8 *Task 9. Merging of Records and Addition of "Not Checked for Holdings" Statements*

All records described above were merged into a single file. A "Not Checked for Holdings" statement was added to each of the files described below (P-12):

SOURCE OF RECORD	"NOT CHECKED FOR HOLDINGS" ADDED FOR
MARC	All Libraries
MASFILE-I	No Libraries
SUNYAB Master File	Binghamton, Rochester, Syracuse
SUNYAB Current	Binghamton, Cornell, Rochester, Syracuse
Cornell Current	Binghamton, Buffalo, Rochester, Syracuse

2.9 *Task 10. MASFILE-II Listing in Main Entry Order*

A computer program was written (P-13) which generated main entry sorting fields from MARC-II format records. A sort was performed using this field (P-9). A program was written which listed the file (P-11). The entire file was then listed and sent to the FAUL Central office.

Subsequently the print tape was used to generate 200 Computer Output Microfiche set using a KOM-90 machine in Rochester. This product was not a part of the original work statement. One fiche set forms Part II of this report and is inserted on the inside back cover.

3.0 GRAPHIC COMPARISON OF MARC-II AND MASFILE-II FORMAT

The MASFILE-II and MARC-II formats are quite similar since only a few additions and changes were made to the MARC-II format to adapt it to the MASFILE-II application. Logically, the two record formats appear identical on magnetic tape with the record structure shown in Figure 1. Both are variable length records with leading information containing record length and other descriptive information. Both have a tag table containing tag numbers, location, and length of data for each tagged-piece of information. In both, the remainder of the record contains variable length data items each preceded by two indicators. Subfields of the items are separated by standard MARC-II delimiters.

The contents of the data item for each tag is, in most cases, the same for the MARC and MASFILE formats. The content of the fields tagged from 011 through 899 are identical in the two formats. The major differences between the two formats occur in the fields tagged 001 (Fixed Length Data Elements), 008 (Fixed Length Fields), 010 (LC Card Number) and 910 (Local Holdings).

The fields tagged 900 and above are provided by the Library of Congress for local use and therefore do not appear as fields in any MARC-II records distributed by LC. In the MASFILE-II format, the 910 field was assigned to contain local call numbers and holdings information for FAUL libraries.

As used in MASFILE-II, the 910 field has two indicators which are interpreted as a single two-digit number and a single ($a) data subfield. The number formed by the indicators is a code number for the FAUL libraries.

Field	Indicator	Subfield	Library
910	01	$a	Buffalo
910	02	$a	Rochester
910	03	$a	Syracuse
910	04	$a	Binghamton
910	05	$a	Cornell

The data field contains the National Union Catalog code for the member libraries followed by a character "/" and either the phrase, "not checked for holdings" or the local call number and number of copies separated by another character "/". Example of a holdings statement: 91001$aNBU/Z116/(3) means that SUNY-Buffalo owns three copies of an item classed as Z116. Example: 91005$aNIC/NOT CHECKED FOR HOLDINGS, means that the item has not been checked by Cornell to determine if Cornell owns it. If Cornell had done so and a copy was in its collection, the holdings statement would reflect that fact similar to the preceding statement for Buffalo.

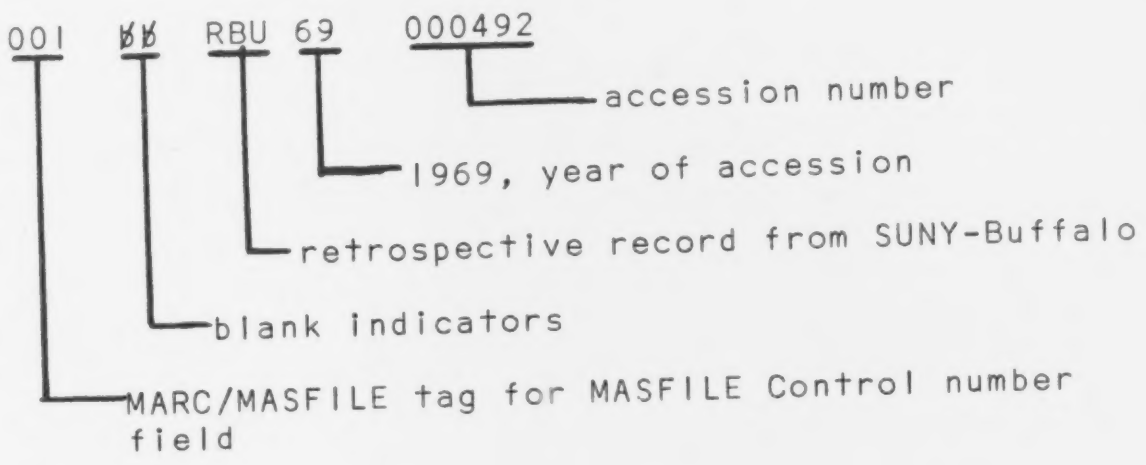
The 008 tagged field which for both MARC-II and MASFILE-II contains fixed length data elements is identical in structure for both formats. The full list of MARC-II elements is presented in Figure 2.

MARC-II elements which are omitted in MASFILE-II are the intellectual Level Code, the Government Publication Indicator, and (for Cornell and SUNY-Buffalo) the Main Entry in Body of Entry Indicator. The Cataloging Source Code has these additional values in MASFILE-II:

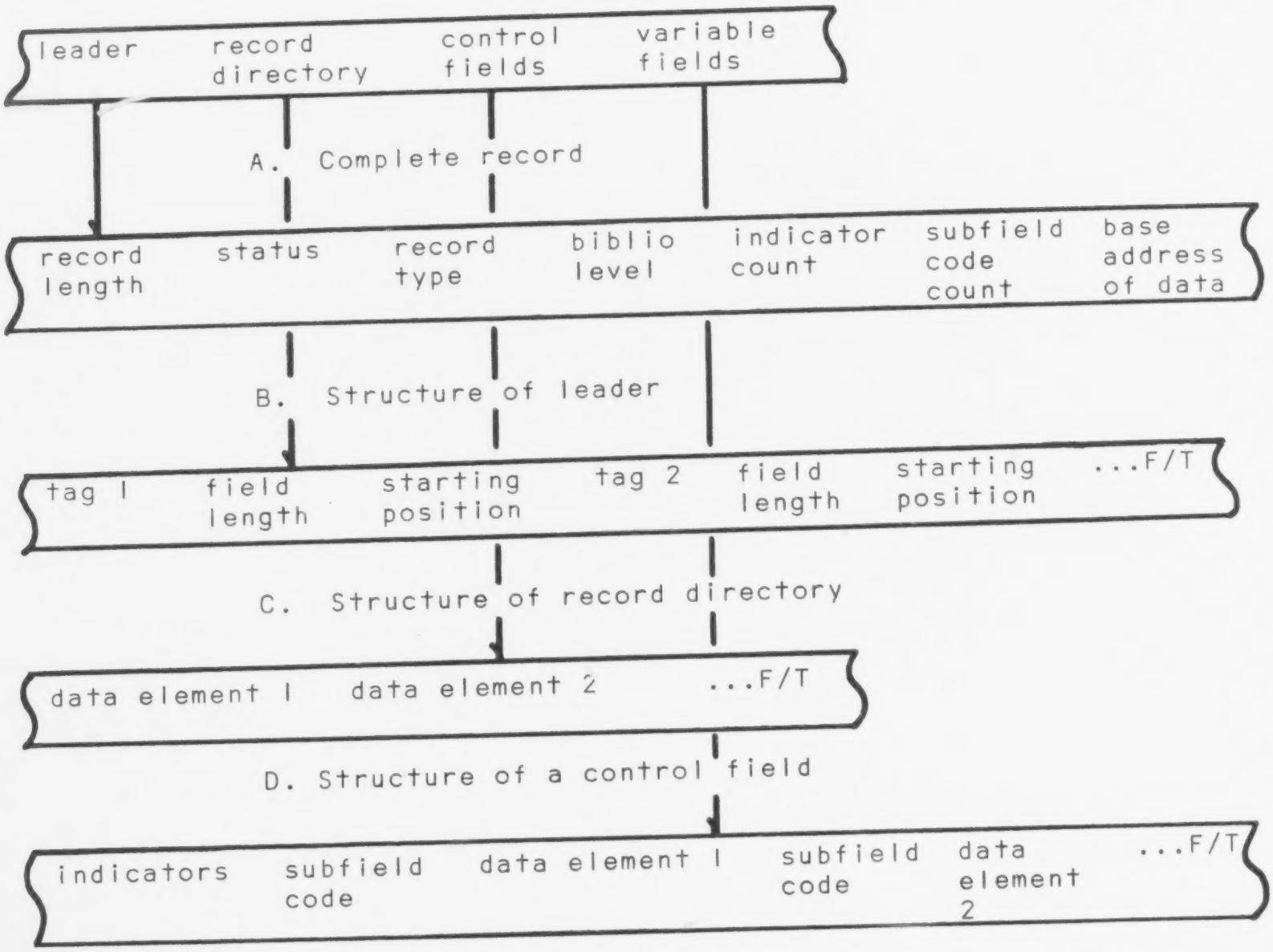
x	original cataloging (i.e. FAUL)
y	Title II: shared cataloging
z	NUC entry

In the MARC-II records, the 001 tag is used for the LC Control Number which is a formatted version of the LC Card Number. The 010 tagged field in MARC-II is reserved for the LC Card Number but it has never actually been entered in the record by LC so far.

For MASFILE-II, the 001 tag is used for the MASFILE Control Number. This eleven digit number is constructed in the format SSSYYNNNNNN, where S represents a three letter source file code (MRC for MARC, RBU for retrospective Buffalo records, NBU for newly cataloged Buffalo records, NIC for newly cataloged Cornell records, and MFI for MASFILE-I), Y a two-digit year, and N represents six-digit accession number. The result could appear as this example illustrates:


001 ØØ RBU 69 000492
accession number
1969, year of accession
retrospective record from SUNY-Buffalo
blank indicators
MARC/MASFILE tag for MASFILE Control number field

In the MASFILE format the 010 field contains the LC Card Number.



E. Structure of a variable field

N.B. More detailed layout information is contained in MARC Manuals Used by the Library of Congress. ALA-ISAD, 1969, and changes as provided to subscribers by the MARC Tape Distribution Service (LC).

FIGURE 1. MARC II Record Structure

1. date entered on file
2. type of publication date code
3. date 1
4. date 2
5. country of publication code
6. illustration code
7. intellectual level code
8. form of reproduction code
9. form of content code
10. government publication indicator
11. conference or meeting
12. festschrift indicator
13. index indicator
14. main entry in body of entry indicator[1/]
15. fiction indicator
16. biography code
17. language code
18. modified record indicator
19. cataloging source code[2/]

Source: Ibid. "MARC Manual Vol. 1," p. 32.

1/ omitted from Cornell and SUNY-Buffalo records since worksheets did not contain them

2/ x, y, z codes added (see text, p. 6.)

FIGURE 2. MARC II Fixed Length Data Elements (Tag 008)

4.0 TRANSMISSION OF MASFILE-II RECORDS

The transmission of MASFILE-II records to and from local libraries either by mail or by terminal would require only a straight-forward reformatting of the MASFILE records. It would not be necessary to modify the contents of the records or the order and arrangement of the tagged fields. Figure 3 shows a general outline of the transmission procedures.

To transmit to local terminals or line printers, a format similar to that used for editing and correction as described in Section 2.0 would be usable. In this format each record is broken up into the component tagged fields and entered as a series of 85 character lines (maximum) with each newly tagged field beginning on a new line. Each line would contain the three-character tag, the two characters for the indicators, and 80 characters of data from the field. If fields contain more than 80 characters of data, succeeding continuation lines contain blank tag and indicators and the remaining data of the field. This format can be entered directly into ATS storage.

The system to accomplish this type of transmission to terminals must include a method to receive identifying descriptions of the desired records, locate them in the file, reformat the records to the form acceptable for terminal output, and transmit the reformatted records to the intended recipient through ATS (or some similar system).

The transmission of MASFILE record data by mail could use the same format and procedure described above, except that printed copy would be generated by the reformatting program. It is possible to define practically any format for printing (even one similar in appearance to a catalog card) and concomitantly to design a special procedure for using that particular format.

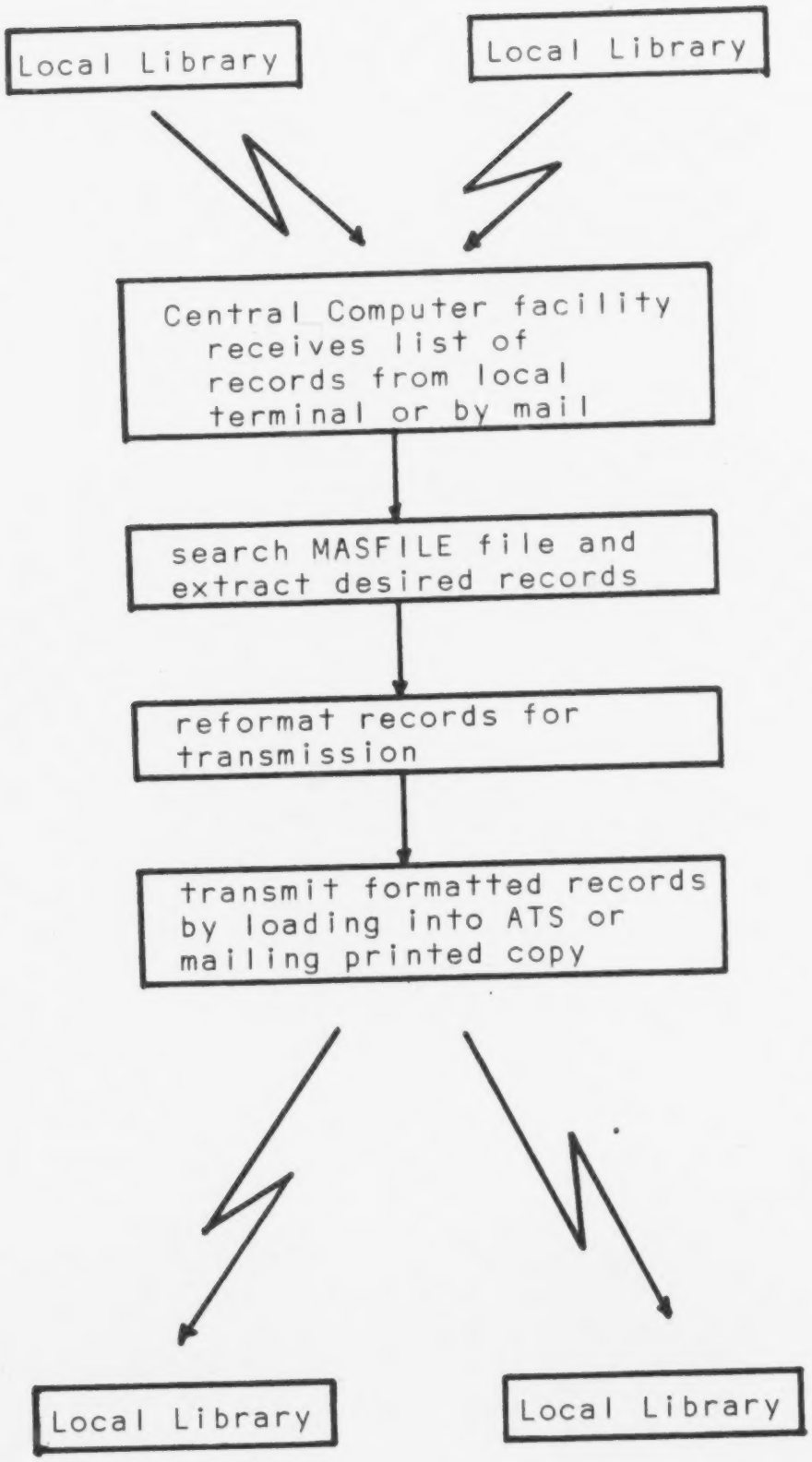

Local Library
Local Library
Central Computer facility receives list of records from local terminal or by mail
search MASFILE file and extract desired records
reformat records for transmission
transmit formatted records by loading into ATS or mailing printed copy
Local Library
Local Library

FIGURE 3. Procedure for Transmitting MASFILE Records to and from Local Libraries

5.0 FIELDS NEEDED IN MASFILE FOR SPECIFIC BIBLIOGRAPHICAL SERVICES

5.1 Bibliographical Services

FAUL document MF-15.4 outlined the following uses and their priorities in a centralized store of bibliographic information in machine-readable form. The priorities were determined by iterative questionnaire to selected personnel in each library.

Item	Uses	Priority
A	Locate documents in all FAUL libraries	1.0
B	Print selected bibliographies	1.2
C	Eliminate duplication of seldom used materials	1.4
D	Provide lists for exchange of duplicates	1.6
E	Print out-of-print titles for OP searching	1.6
F	Aid in book selection by displaying recent acquisitions	1.7
G	Search and print cataloging copy	1.8
H	Print book catalogs and indexes	1.9
I	Extract pertinent data and print orders to vendors	2.2
J	Statistics for library management regarding overlaps, acquisition subject areas	2.3
K	Circulation transactions	2.3
L	Combined Accession Lists	2.5
M	SDI to faculty	2.6
N	Profile collection by subject areas	2.6

Item	Uses	Priority
O	Verify accuracy of citations for ordering	2.8
P	Used by scholars to verify citations and extract data	2.9
Q	Control and display binding records	3.0

5.2 *Recommended Tagged Fields*

For each of the priority uses specified above, TIDB staff has determined three content levels of MASFILE records and specified them below using MASFILE-II tags. The levels are:

Level 1 Mandatory for specified priority use.

Level 2 Probably desirable for a machine-based retrieval system.

Level 3 Probably desirable for a highly sophisticated machine-based retrieval system.

The levels become more inclusive as the level number increases. Thus a Level 2 record would include all tagged fields in Level 1 plus those specified for Level 2. A Level 3 record would include all tagged fields specified for Levels 1 and 2 and also those specified for Level 3. Therefore, the record levels are applicable only to the specified priority use. If FAUL were to specify a Level 1 record for all priority uses, it would have to include all mandatory tagged fields for all priority uses for that level record. It should be noted that the selection of tagged fields reflect the judgment of TIDB staff; FAUL Central or individual FAUL member libraries may have different points of view, since no systematic study of file use was undertaken as part of this study.

Figure 4 contains a list of the names of MARC-II Variable Fields and their tags. Following the list is a table of uses A-Q, and the field tags which are provided to satisfy each use.

Control Numbers

0 1 0 LC Card Number
0 1 1 Linking LC Card Number
0 1 5 National Bibliography Number
0 1 6 Linking NBN
0 2 0 Standard Book Number
0 2 1 Linking SBN
0 2 5 Overseas Acquisitions Number (PL 480, LACAP, etc.)
0 2 6 Linking OAN Number
0 3 5 Local System Number
0 3 6 Linking Local Number
0 4 0 Cataloging Source
0 4 1 Languages
0 4 2 Search Code

Knowledge Numbers

0 5 0 LC Call Number
0 5 1 Copy Statement
0 6 0 NLM Call Number
0 7 0 NAL Call Number
0 7 1 NAL Subject Category Number
0 8 0 UDC Number
0 8 1 BNB Classification Number
0 8 2 Dewey Decimal Classification No.
0 8 6 Supt. of Documents Classification
0 9 0 Local Call Number

Main Entry

1 0 0 Personal Name
1 1 0 Corporate Name
1 1 1 Conference or Meeting
1 3 0 Uniform Title Heading

Supplied Titles

2 4 0 Uniform Title
2 4 1 Romanized Title
2 4 2 Translated Title

Title Paragraph

2 4 5 Title
2 5 0 Edition Statement
2 6 0 Imprint

Collation

3 0 0 Collation
3 5 0 Bibliographic Price
3 6 0 Converted Price

Series Notes

4 0 0 Personal Name-Title (Traced Same)
4 1 0 Corporate Name-Title (Traced Same)
4 1 1 Conference-Title (Traced Same)
4 4 0 Title (Traced Same)
4 9 0 Series Unitraced or Traced Differently

Bibliographic Notes

5 0 0 General Notes
5 0 1 "Bound With" Note
5 0 2 Dissertation Note
5 0 3 Bibliographic Hist. Note
5 0 4 Bibliography Note
5 0 5 Contents Note (Formatted)
5 0 6 "Limited Use" Note
5 2 0 Abstract or Annotation

Subject Added Entries

6 0 0 Personal Name
6 1 0 Corporate Name (excluding political jurisdiction alone)
6 1 1 Conference or Meeting
6 3 0 Uniform Title Heading

LC Subject Headings

6 5 0 Topical
6 5 1 Geographic Names
6 5 2 Political Jurisdictions Alone or with Subject Subdivisions

Other Subject Headings

6 6 0 NLM Subject Headings (MESH)
6 7 0 NAL Subject Headings
6 9 0 Local Subject Heading Systems

Other Added Entries

7 0 0 Personal Name
7 1 0 Corporate Name
7 1 1 Conference or Meeting
7 3 0 Uniform Title Heading
7 4 0 Title Traced Differently
7 5 0 Name Not Capable of Authorship

Source: Ibid. p. 42.

FIGURE 4. MARC-II Variable Field Tags

Series Added Entries

8 0 0 Personal Name-Title
8 1 0 Corporate Name-Title
8 1 1 Conference or Meeting-Title
8 4 0 Title

Local

9 1 0 FAUL library holdings statements

FIGURE 4. MARC-II Variable Field Tags (cont.)

Specified Priority Use	Record Level 1 MASFILE II tags	2 (Includes tagged fields from Level 1, plus)	3 (Includes tagged fields from Levels 1 and 2, plus)
A	001, 100, 100, 111, 130, 245,* 250, 260, 910	010, 050, 245, 600, 610, 611, 630, 650, 651, 652, 700, 710, 711, 730, 800, 810, 811, 840	015, 020, 025, 040, 041, 060, 070, 400, 410, 411, 440, 490
B	001, 100, 110, 111, 130, 245,* 250, 260, 910	Not Needed	Not Needed
C		As specified for B Above	
D		As specified for B above	
E		As specified for B above	
F	001, 100, 110 111, 130, 245,* 250, 260, 910	Not Needed	Not Needed
G	001, 010, 100, 110, 111, 130, 240, 241, 245, 250, 260, 300, 400, 410, 411, 440, 490, 500, 502, 600, 610, 611, 630, 650, 651, 652, 700, 710, 711, 730, 800, 810, 811, 840, 910	Does Not Apply	Does Not Apply
H (Catalogs)		Same as G Above	
H (Author) (Indexes)	001, 100, 110, 111, 130, 245,* 250, 260, 700, 710, 711, 910	Not Needed	Not Needed
H (Title) (Index)	001, 100, 110, 111, 130, 245,* 250, 260, 730, 740, 910	Not Needed	Not Needed

* denotes title only; not the complete title statement

Specified Priority Use	Record Level 1 MASFILE II tags	Record Level 2 (Includes tagged fields from Level 1, plus)	Record Level 3 (Includes tagged fields from Levels 1 and 2, plus)
H (Subject) (Index)	001, 100, 110, 111, 130, 245,* 250, 260, 600, 610, 611, 630, 650, 651, 652, 910	Not Needed	Not Needed
H (Series)	001, 100, 110, 111, 130, 245,* 250, 260, 800, 810, 811, 840, 910	Not Needed	Not Needed
I	001, 100, 110, 111, 130, 245,* 250, 260, 910	350, 400, 410, 411, 440, 490, 502, 700, 710, 711, 730	Not Needed
J	Same as Level 1 for A	600, 610, 611, 630, 650, 651, 652	Not Needed
K	001, 910	245*	100, 110, 111, 130
L	Same as B Above		
M (by Class) (Author) (or) (Terms In) (Title)	001, 100, 110, 111, 130, 245,* 250, 260, 910	Not Needed	
M (by) (Subject)	001, 100, 110, 111, 130, 245,* 250, 260, 600, 610, 611, 630, 650, 651, 652, 910	Not Needed	
N	001, 600, 610, 611, 630, 650, 651, 652, 910	Not Needed	
O	Same as A Above		

* denotes title only; not the complete title statement

Specified Priority Use	Record Level 1 MASFILE II tags	2 (Includes tagged fields from Level 1, plus)	3 (Includes tagged fields from Levels 1 and 2, plus)
P	Same as A Above		
Q	001, 910	100, 110, 111, 130, 245*	Not Needed

* denotes title only; not the complete title statement

5.3 *Recommended Record Size*

It is recommended that FAUL consider adopting a Level 1 record suitable for all uses except priority item G ("Search and print cataloging copy") and priority item H ("Print book catalogs and indexes"). If this is done, a Level 3 record will be generated which will satisfy 20 out of the 22 uses outlined above, at perhaps 30 to 40 percent of the cost of generating a Level 1 record for products G and H.

6.0 PROCEDURES FOR MODIFICATION OF MASFILE-II RECORDS

Modification of MASFILE-II records by FAUL libraries could be performed in a manner similar to the conversion of data from MASFILE-I to MASFILE-II. This procedure involves the selection of the needed records from the master file or MARC Distribution Service file, reformatting these records and loading them into ATS, making desired modifications in ATS, and returning the output from ATS to the MASFILE-II record structure. A simple flow chart of this process is presented in Figure 5.*

The primary difficulty involved in the implementation of this procedure is loading the special characters used in the MARC Distribution Service tapes into the ATS system. Special characters do not exist in ATS as a single bit string, and special translation facilities would have to exist in the formatting and returning programs to convert the special characters (alphabetic characters and diacriticals) into some understandable and legal character combination. The acceptable way of entering these characters from the keyboard requires typing the first character of the hexadecimal code for the character, backspace, and type the second character of the code. As a general practice this is awkward and unacceptable because the hexcode equivalence table is unwieldy and it is impossible to tell from reading printed copy which of the hex characters was entered first, thereby making proofreading very difficult.

Given that the special character translation problem is resolved, the modification of records can be made into a routine procedure. For instance, one day a FAUL library could transmit lists of desired records to the ATS tape queue. This tape would be input with the master file to the program to select and format MASFILE-II or MARC records, and selection, formatting and loading of records into ATS for the library could take place,say, overnight. The library staff could then modify the records at their convenience through ATS and, when the modified records are in final form, transmit them to the tape queue. The reformatting program would then be run overnight to return the records to the MASFILE-II form for the library's use. This process would take a minimum of two days in a typical installation, but could be a regular routine of processing and should run in a reliable manner.

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* See also Searching and Editing Bibliographic Records Using the IBM Administrative Terminal System (ATS), by Linda Webb and James Turner. FAUL Technical Memorandum FTM 70-1, May 1970.

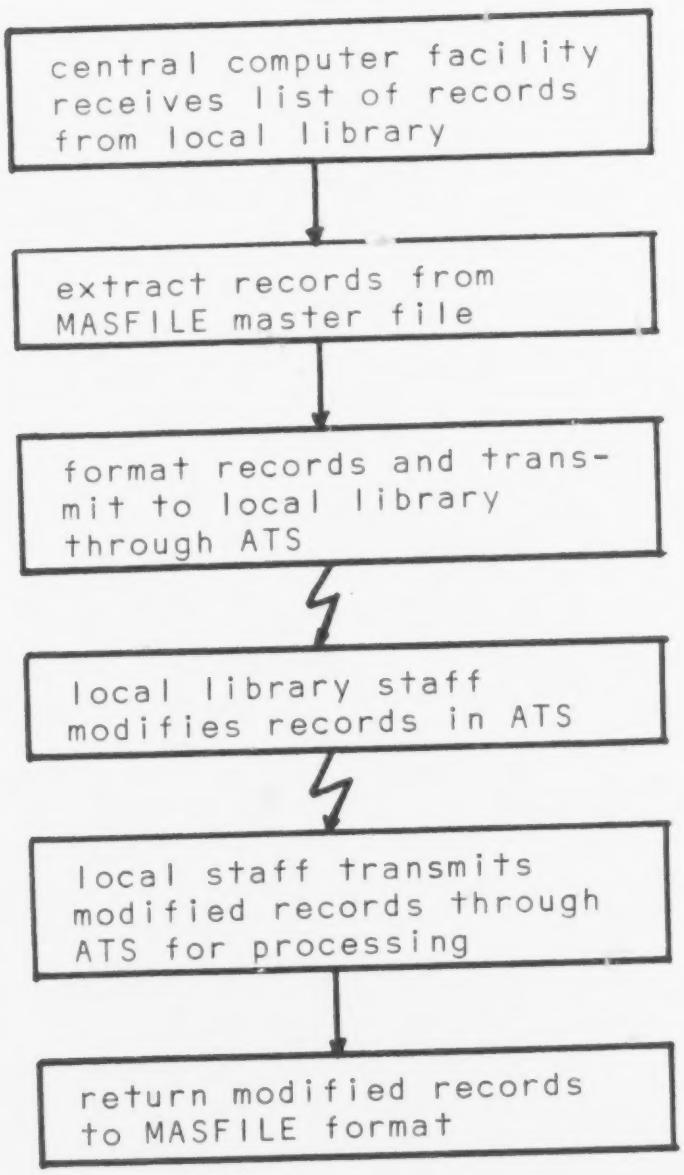
central computer facility receives list of records from local library
extract records from MASFILE master file
format records and transmit to local library through ATS
local library staff modifies records in ATS
local staff transmits modified records through ATS for processing
return modified records to MASFILE format

FIGURE 5. Procedure for Local Library Modification of MASFILE Records

7.0 PROCEDURE FOR INPUTTING CURRENT RECORDS

The regular inputting of current local records into the MASFILE master file could be accomplished using ATS by a system similar to that used for the shelf list conversion project at SUNYAB. Records could be cataloged and then typed into ATS at each local FAUL library and regularly transmitted to some central processing system for formatting and incorporation into the file. On campuses which supported ATS as a local text editing system, records could be mailed in ATS format in lieu of transmitting them.

Data to be entered into the file would be filled in on the Cataloger's worksheets as used for MASFILE-II. Two methods were used to input data in the MASFILE-II project: 1) filling in the worksheet line by line with required data, and 2) entering all data from the catalog card on the worksheet and adding tags and delimiters. The first method tends to yield data which is easier to input and with relatively few errors.

The data, when proofread and corrected at the local library, would be transmitted through ATS to the tape queue at a central location. Then, regularly, probably every night, programs would be run which receive the data from the tape queue, convert it to the MASFILE record format, and enter it in the MASFILE master file for future output processing.

8.0 METHOD FOR IDENTIFICATION AND SELECTION

The system for extracting records and groups of records from MASFILE for various types of listings involves two separate problems: the problem of record selection and the filing problem for each type of listing. The software exists as part of the MASFILE-II project to solve the filing problem for main entry and class number listings, but the filing problem for subject headings is not solved and may be unsolvable for data in the MASFILE-II format.

To use the filing rules defined by Theodore Hines* for subject headings, subfields of the subject headings must be entered manually in the records in the order prescribed by Hines. Unfortunately this order is quite different from the order used by the Library of Congress for entering data for MARC tape distribution, and there is no automatic way to rearrange the data subfields for correct filing. Some work has been done in this area by Jessica Harris as part of her dissertation at Columbia University, and if it is desired to try listing by subject headings, her work is the best place to start.

The record selection problem is solvable in the most straight forward manner by providing a selection program with lists of acceptable data combinations (and possibly a series of Boolean combinations of lists). The program would then be designed to select those records which contain exactly those specified data combinations. For example, if it were desired to select all records with main entry Smith, Jones or McMurtrie, the program would be provided with the list of names, the tag of the field to be searched, and the desired subfield code. The program would then search every record of the file for every entry of the data list in the specified field and subfield.

This technique has one advantage and several disadvantages. The advantage is that it can be made to work. The disadvantages are that it would be very expensive in processing time because of the linear file, is awkward to program and control, and depends on exact matching of list entries and record data elements which require precise uniformity of data (see Section 9.2 below).

It would be advisable, before trying this brute-force technique for record selection, to try defining as specifically as possible those criteria to be used for record selection. Then depending on the criteria, various orderings of the file or various types of indexes could be produced to make possible relatively efficient searches for these specific types of criteria.

*Computer Filing of Index, Bibliographic, and Catalog Entries, by T. Hines and J. Harris, Newark: Bro-Dart Foundation, 1966

9.0 MAJOR PROBLEM AREAS

The major problem areas encountered in this project fall into two general categories, the problems of handling diacriticals and special characters and the problems of getting clean, uniform data into the file. In the first case, problems include the entering of special characters into the file, filing of entries containing special characters, and printing of words containing special characters. The problems of data which contain errors or is not entered uniformly appear mainly in filing and in defining search criteria for the master file.

9.1 Special Characters

Special characters are defined for this report as those characters which appear in the MARC character set but which do not appear on the ATS keyboard or the IBM full TN print chain. These characters include diacritical marks (umlaut,circumflex, title, etc.), letters from non-English alphabets (Polish Ł, Icelandic thorn, Scandinavian Ø, etc.), dipthongs, some punctuation marks (braces, high comma, British pound symbol, etc.), and MARC control characters (delimiter, field terminator, record terminator).

The first problem is that of entering data containing these special characters into the MASFILE file. For the MASFILE-II project, this was done by entering the hex code for these characters directly at the terminal. Appendix II.2 presents a table containing the hex codes for each legal character in the file. To enter an umlaut, for example, one would type C (the first character of the hex code), backspace, and then type A (the second character of the code).

This technique does record the special characters in the file, but it has several disadvantages. First, the procedure is awkward: both the person who translates from character to code and the typist doing the transcribing are likely to make mistakes. Second, it is not possible to tell from the printed copy which character of the code was entered first, and proofreading of the characters becomes impossible. Third, in ATS, if a line of text exceeds the ATS fixed line length the last characters of data may be last. Lines containing special characters entered this way are difficult to determine because line length character counts are awkward to perform.

A technique should be developed for entering special characters by discrete, easy to remember substitute characters or possibly by an escape code character followed by the substitute characters. Some clear and easy to understand system for entering these characters would make it at least possible to get the characters in the file reasonably correctly and with a minimum of frustration.

The second problem is that of filing entries containing these special characters correctly. Since all punctuation, including diacriticals, is ignored in the filing system proposed by Hines, the primary difficulty occurs with letters of foreign alphabets and with dipthongs.

For filing in the MASFILE-II project, each of the foreign letters was made to file immediately after its English equivalent. That is, a Polish Ł files between L and M; a Scandinavian Ø files between O and P and a Đ files between D and E, and a Turkish ı files between I and J. The dipthongs AE and OE file as the two-letter combinations AE and OE respectively. The umlaut, when it exists in the file preceeding a letter, causes the word to file as if there were a letter E following that letter, as in ALA filing rules.

This procedure may or may not be acceptable to FAUL library staff members. It would be appropriate for library staff within FAUL to define rigorous rules for the filing of all special characters appearing in the MARC-II files, or adopt some external standard acceptable to all.

The third problem is that of printing records which contain the special characters. This could be solved most easily by a computer manufacturer marketing a printing device which would produce the special alphabetic characters and permit superimposing diacritical marks on the letters they are supposed to modify. With the equipment currently available it is barely possible and using extremely costly procedures to produce a small group of special alphabetic characters and simulate a few of the diacritical marks. Special library print trains and CRT-based printing devices have already pointed the way to future techniques for attacking the problem, but should be employed cooperatively because of their high cost.

For the final listing of the MASFILE-II project the following conventions were used. Non-English letters were printed as their unmodified English equivalents. Dipthongs were printed as if written as two letters, and an umlaut modifying a letter caused a lower case e to be printed following the letter. These substitutions permitted the relatively efficient printing of the file, but they make it impossible to tell from the final printout whether or not the special characters are actually present in the file.

Staff members of the FAUL libraries should set up conventions for the printing of the special characters to make it possible to distinguish between English and foreign letters. Printing conventions (i.e. substitute characters) should also be set up for the diacritical marks which are unprintable so that their presence in the record would also be discernable from the printout.

9.2 *Uniformity of Data*

In order to insure that the data in the MASFILE files are usable and generally acceptable for automatic data processing, the FAUL library staff members and committees must set up conventions and procedures to insure that data is entered into the file in a uniform manner.

For automatic data identification and correct filing it is necessary that whenever a given piece of information appears in the file it appears in exactly the same form. Differences in spelling, punctuation, capitalization, and even spacing will cause two items intended to be the same to be considered different in processing. The likelihood of such variation requires high quality control, probably a team of central editors.

The most glaring example of difficulty in filing when data are not entered uniformly appears in the MASFILE-II file with entries beginning with U.S. For all data entered in MASFILE through the MARC Distribution Service, the initials U.S. are not separated by a space. For all data entered from FAUL member libraries, the initials are separated by a space. This difference causes all U.S. entries from LC to file after all U.S. entries from FAUL member libraries.

Furthermore, the presence of extra or additional information in some versions of an entry will cause it to be considered different from other versions of the same entry. This is most obvious in the MASFILE-II listing in the entries for McMurtrie, Douglas Crawford. All records for which the dates in the main entry are 1888 - file before all entries for which the dates are 1888 - 1944. And, of course, the two records in which this gentleman's name is spelled McMurtie file before all entries in which it is spelled McMurtrie.

Two items, intended to be the same, must appear identical whenever they appear in any record in the file. Note the MASFILE-II list (Section 12.0), where see references are generated from added entries and interfiled with main entries. Personal and corporate authors must be entered in the same format for both main and added entries.

9.3 *General Comments*

The problems outlined above are resolvable if libraries which plan to use the file or enter data into the file cooperate and agree to certain minimum standards and system objectives. In most machine-readable data base creation projects no purpose seems to be specified. A data base which is being constructed to provide machine access to the base (search and retrieval) should be constructed in a much different way than

one which is to be used for the production of catalogs and indexes. The need for diacriticals is one area where, TIDB believes, there is such a distinct dichotomy. A library patron at a terminal searching in a data base, we feel, will not remember nor perhaps know how to use diacriticals such as the Polish Ł. He will miss those entries. On the other hand, not including some diacriticals does violence to the original language. Nevertheless, entries may be missed by patrons using a retrieval system in which there is a blind insertion of some diacriticals particularly if there is a complex procedure required at his terminal to enter the character. Similar problems will exist because of the use, or lack of use, of abbreviations.

The answer to the diacritical and abbreviation question is relatively simple: don't use any. This area is rather easily resolved because no present system (non-machine based) can be affected by it. Entries can still be humanly filed into existing card catalogs in the proper place. Future conversion projects should take these into consideration. The non-use of diacriticals and abbreviations will resolve many of the problems outlined above. MARC characters would have to be converted to this standard but this is a much easier problem than entering and converting to MARC particularly when one keeps in mind the purpose of the file.

The libraries (FAUL) should, perhaps, constrain themselves to using only characters on a standard print chain such as the TN chain. If this is done, the internal representation of the character will always be equivalent to the external representation and entering, proofing and queries will become much easier.

The standardization of entries can also be resolved. Perhaps rules of uniformity will have to be established among cooperating libraries. The adoption of Hines rules would be a solution, although probably unacceptable. One possible solution here would be to enter authors, titles, and added entries in both forms. This would provide both a mechanism of listing in the traditional form and resolve filing problems which are created by non-uniformity. The retrieval problem would also be resolved. This is a very expensive procedure both in the cost of storing and manipulating the entries. It should, however, be explored. This alternative may be less expensive than attempting to standardize entries in FAUL libraries.

Despite all the problems described in this section, one must keep in mind the purpose of the file. If it is to be used for a retrieval system even with the data as presently entered, one must ask the question, "Is it better to have a retrieval system with 60% recall or no retrieval system?"

10.0 SUMMARY OF ACTIVITIES

Time spent in the MASFILE-II project can be divided into three activities: (1) time spent in preparing and entering new data from Cornell and SUNY-Buffalo, (2) time spent in the conversion of retrospective SUNY -Buffalo data and MASFILE-I data, and (3) professional time spent in programming, testing, setting up computer runs and general supervision.

Of the new data input, time spent in completing cataloger's worksheets at SUNY-Buffalo was 23-1/2 hours, and time spent tagging data on cataloger's worksheets at Cornell was 28 hours. For the input of these new records into the files, 28-1/2 hours were spent in typing, 6 hours in proofreading, 5 hours in coding diacriticals and special characters, and 15-1/2 hours in corrections and addition of special character codes.

For the conversion of retrospective SUNY-Buffalo and MASFILE-I data, 142 hours were spent in proofreading, correction, and conversion to MASFILE-II tagging; and 204 hours were spent in typing of these corrections into ATS. The addition of the Cornell holdings information to the retrospective SUNY-Buffalo records consumed 20 hours of Cornell staff effort.

Of the TIDB professional time spent in the project, a total of 375 hours were spent in writing and testing of the eleven programs required for the project. An additional 71 hours were required for setting up of production runs of the systems, and 93 hours were spent in organizing, supervising and checking the data.

This information is presented in tabular form in Figure 6.

INPUT OF NEW ACQUISITIONS	*HOURS*
UB cataloging	23.5
Cornell cataloging	28
input typing	28.5
proofreading	6
coding of special characters	5
correction typing	15.5
CONVERSION OF RETROSPECTIVE SUNY-BUFFALO AND MASFILE-I RECORDS	
addition of Cornell holdings	20
conversion and proofreading	142
correction typing	204
EXPENDED PROFESSIONAL TIME AT TIDB	
program generation and debugging	375
setting up production runs	71
general supervision	93
Report Preparation	100
TOTAL	1111.5

FIGURE 6. Summary of Time Expended on the MASFILE-II Project

11.0 APPENDICES

Appendix 11.1 *MASFILE-II Work Statement*

Five Associated University Libraries

Binghamton / Buffalo / Cornell / Rochester / Syracuse

Office of the Coordinator of Library Systems

July 11, 1969

To: Ryburn Ross, Chairman
F.A.U.L. Systems Committee

Gerald Lazorick, Director
Technical Information Dissemination Bureau
SUNY-Buffalo

From: Ron Miller, Coordinator of Library Systems
F.A.U.L.

Subject: MASFILE-II Phase I work statement

The following tasks will be performed in order to satisfy the objectives of the MASFILE-II Phase I Project as authorized and funded at the May 12, 1969 meeting of the F.A.U.L. Board of Directors. This statement incorporates revisions made by R. Miller, G. Lazorick, and R. Ross on June 24, and the Systems Committee on June 5-6. The Board of Directors has approved these revisions at its meeting on July 7, 1969. The work as stated below is to be accomplished under the general monitorship of the Systems Committee. The names of persons assuming primary responsibility for specific tasks are noted in the left margin.

WORK STATEMENT

Lazorick 1. All MASFILE-I records will be converted into the MARC-II Communications Format as closely as possible. This conversion will require computer programming and human intervention to accomplish. The resultant format will be called the MASFILE-II Format.

Lazorick 2. Up to 1000 bibliographic records in the Library of Congress Z Classification will be extracted from the tapes distributed by the Library of Congress by the MARC Tape Distribution Service. These records will be converted into the MASFILE-II Format, identified and merged with the records converted in Step 1 above.

Lazorick 3. All records in the Z classification which were converted to machine-readable form by the TIDB for the SUNYAB Library between September 1, 1968 and July 1, 1969 will be extracted from the SUNYAB tape files, listed by main entry in alphabetical order arranged by the collation rules contained in Computer Filing of index, bibliographic, and catalog entries by T. Hines and J. Harris (Newark, Bro-Dart Foundation, 1966), and mailed to R. Ross at Olin Library, Cornell University.

106 Roney Lane
Syracuse, New York 13210
Phone: (315) 476-5541, Ext. 3021

Ross 4. Cornell Library staff will add holdings statements to records extracted in item 3 composed of NUC #, Cornell's class # and quantity of copies owned in a tagging format to be determined by representatives of the Systems Committee, and return the above list to G. Lazorick. Time and cost measurements will be recorded by Cornell for inclusion in the project report.

Lazorick 5. Records extracted in step 3 and modified in step 4 above will be converted into the MASFILE-II Format and merged with the records previously converted.

Lazorick 6. All records processed in the Z classification between July 1 - October 31 will be input from F.A.U.L. Cataloger's worksheets by SUNYAB cataloging staff via ATS terminals at Buffalo. These records will also be merged with previously converted records.

Ross 7. All records processed onto F.A.U.L. Cataloger's worksheets in the Z classification between July 1 - October 31 will be sent from Cornell to Buffalo by mail.

Lazorick 8. These records will be input at Buffalo by ATS, and merged with records previously converted above.

Lazorick 9. Each record converted in this project will contain holdings statements where they exist as tagged 900 fields, and a "Not checked for holdings" statement will appear where holdings are unknown.

10. A report will be written which will include the following:

A. A summary of procedures used to accomplish the above tasks.

B. A graphic comparison of the MARC-II format and the MASFILE-II Format, indicating literal identities, variations, omissions and additions between the two formats.

C. Recommend what modifications to the F.A.U.L. MASFILE-II record are needed to transmit records (by mail or by IBM 2741 communications terminal) from MASFILE to local terminals or line printers in the MARC II format.

D. Recommend which data elements must be resident in a MASFILE-II record to perform ~~by the~~ Systems Committee-specified priority uses.

E. Recommend workable procedures for each F.A.U.L. Library to modify MASFILE-II records whether input from the MARC Tape Distribution Service or from local cataloging systems in a central computer on a routine basis. (These procedures may be implemented in Phase II). Modifications may include the addition of local NUC codes, class numbers, holdings, and added entries.

F. Recommend workable procedures for inputting current local records into MASFILE, omitting retrospective conversion unless clean data already exists in machine readable form, from each F.A.U.L. library.

G. Recommend a workable method for identifying and selecting specific records and groups of records in MASFILE for listing by subject, class numbers, and main entry.

H. Isolate major problem areas resulting from this project which appropriate F.A.U.L. library staff members and committees should solve.

I. Summarize time spent and activities performed in computer testing, program runs, clerical operations, and professional time.

J. A printout containing a merged list of MASFILE-II records arranged by the collation rules contained in Computer filing of index, bibliographic, and catalog entries, by T. Hines and J. Harris (Newark, Bro-Dart Foundation, 1966). The list will be in main entry order, possibly with KWIC or KWOC title and subject indexes.

This procedure will

1. Produce a merged tape file of records in the MASFILE-II Format from five sources: MASFILE-I, LC, SUNYAB (retrospective), SUNYAB (current), and Cornell, increasing the quantity of F.A.U.L. records in the Z classification.

2. These records will be in a unified, revised format as close to MARC-II as possible.

3. Duplicated items will appear as separate items in the file -- an unfortunate circumstance in the long run in my view, since records in the file will not be checked locally by all F.A.U.L. libraries during this phase. If we persist in the present direction of developing an on-line query system for interlibrary loan and other uses this updating work will have to be done sometime. The question HOW will be answered as part of the F.A.U.L. contract with the Technical Information Dissemination Bureau.

This means that these additional tasks must be done by other F.A.U.L. member personnel:

1. Cornell and Buffalo must redesign the F.A.U.L. Cataloger's Worksheet to permit the addition of MARC-II tags, delimiters and indicators, as well as mandatory and optional fields. (Johnston and Hacker meet in my office on July 15.)

2. Three tags unique to each library must be assigned to contain NUC code, local call number, and quantity of copies held by each library. These tags should come from the 900-999 tags reserved for local use in the MARC-II Communications Format. The information contained in them may be inserted by machine if the data appears elsewhere on the worksheet.

3. Cataloging staff should be assigned at Cornell and Buffalo to fill in the revised worksheet with data elements as part of the cataloging operation, for Z classed items at each institution. Myles Slatin has approved use of library staff and worksheets for this purpose.

The details and unforeseen problems will be worked out as the work progresses. In general, the above tasks lay out the operational areas and output requirements of F.A.U.L.' agreement with The Technical Information Dissemination Bureau at SUNY-Buffalo. A letter of intent has been sent and accepted by Gerry.

This work statement and the letter of intent constitute a formal arrangment between the F.A.U.L. Board of Directors and the Technical Information Dissemination Bureau.

Copies to: D. Kaser, M. Slatin

Appendix II.2 *Hex-Code MARC Character Equivalency Table*

APPENDIX II.2

HEX CODE-MARC CHARACTER

HEX CODE	MARC-II CHARACTER
'00'	NULL
'01'	START OF HEADING
'02'	START OF TEXT
'03'	END OF TEXT
'37'	END OF TRANSMISSION
'2D'	ENQUIRY
'2E'	ACKNOWLEDGE
'2F'	BELL
'16'	BACKSPACE
'05'	HORIZONTAL TABULATION
'25'	LINE FEED
'0B'	VERTICAL TABULATION
'0C'	FORM FEED
'0D'	CARRIAGE RETURN
'0E'	SHIFT OUT
'0F'	SHIFT IN
'10'	DATA LINK ESCAPE
'11'	DEVICE CONTROL 1
'12'	DEVICE CONTROL 2
'13'	DEVICE CONTROL 3
'3C'	DEVICE CONTROL 4
'3D'	NEGATIVE ACKNOWLEDGE
'32'	SYNCHRONOUS IDLE
'26'	END OF TRANSMISSION BLOCK
'18'	CANCEL
'19'	END OF MEDIUM
'3F'	SUBSTITUTE
'27'	ESCAPE
'1C'	END OF FILE
'1D'	END OF RECORD
'1E'	FIELD TERMINATOR
'1F'	DOUBLE DAGGER
'40'	SPACE
'5A'	EXCLAMATION POINT, OR SIGN (4F) 5-20-
'7F'	DOUBLE QUOTE
'7B'	NUMBER SIGN
'5B'	DOLLAR SIGN
'6C'	PERCENT SIGN, CENT SIGN
'50'	AMPERSAND
'7D'	SINGLE QUOTE
'4D'	LEFT PARENTHESIS
'5D'	RIGHT PARENTHESIS
'5C'	ASTERISK
'4F'	PLUS SIGN
'6B'	COMMA
'60'	MINUS SIGN

APPENDIX II.2

HEX CODE	MARC-II CHARACTER
'4B'	PERIOD
'61'	SLASH
'F0'	ZERO
'F1'	ONE
'F2'	TWO
'F3'	THREE
'F4'	FOUR
'F5'	FIVE
'F6'	SIX
'F7'	SEVEN
'F8'	EIGHT
'F9'	NINE
'7A'	COLON
'5E'	SEMI-COLON
'4C'	LESS THAN
'7E'	EQUAL SIGN
'6E'	GREATER THAN
'6F'	QUESTION MARK
'7C'	AT SIGN
'C1'	A
'C2'	B
'C3'	C
'C4'	D
'C5'	E
'C6'	F
'C7'	G
'C8'	H
'C9'	I
'D1'	J
'D2'	K
'D3'	L
'D4'	M
'D5'	N
'D6'	O
'D7'	P
'D8'	Q
'D9'	R
'E2'	S
'E3'	T
'E4'	U
'E5'	V
'E6'	W
'E7'	X
'E8'	Y
'E9'	Z

APPENDIX II.2

HEX CODE	MARC-II CHARACTER		
'AD'	LEFT BRACKET	(4A)	5-20-69
'EO'	INVERTED SLASH		
'BD'	RIGHT BRACKET	(5A)	5-20-69
'5F'	CAP, NOT SIGN		
'6D'			
'79'			
'81'	A, LOWER CASE		
'82'	B, LOWER CASE		
'83'	C, LOWER CASE		
'84'	D, LOWER CASE		
'85'	E, LOWER CASE		
'86'	F, LOWER CASE		
'87'	G, LOWER CASE		
'88'	H, LOWER CASE		
'89'	I, LOWER CASE		
'91'	J, LOWER CASE		
'92'	K, LOWER CASE		
'93'	L, LOWER CASE		
'94'	M, LOWER CASE		
'95'	N, LOWER CASE		
'96'	O, LOWER CASE		
'97'	P, LOWER CASE		
'98'	Q, LOWER CASE		
'99'	R, LOWER CASE		
'A2'	S, LOWER CASE		
'A3'	T, LOWER CASE		
'A4'	U, LOWER CASE		
'A5'	V, LOWER CASE		
'A6'	W, LOWER CASE		
'A7'	X, LOWER CASE		
'A8'	Y, LOWER CASE		
'A9'	Z, LOWER CASE		
'CO'	LEFT BRACE		
'6A'			
'DO'	RIGHT BRACE		
'A1'			
'07'	DELETE		
'20'	(unassigned)		
'21'	(unassigned)		
'22'	(unassigned)		
'23'	(unassigned)		
'24'	(unassigned)		
'15'	(unassigned)		
'06'	(unassigned)		

APPENDIX II.2

HEX CODE	MARC-II CHARACTER
'17'	(unassigned)
'28'	(unassigned)
'29'	(unassigned)
'2A'	(unassigned)
'2B'	(unassigned)
'2C'	(unassigned)
'09'	(unassigned)
'0A'	(unassigned)
'1B'	(unassigned)
'30'	(unassigned)
'31'	(unassigned)
'1A'	(unassigned)
'33'	(unassigned)
'34'	(unassigned)
'35'	(unassigned)
'36'	(unassigned)
'08'	(unassigned)
'38'	(unassigned)
'39'	(unassigned)
'3A'	(unassigned)
'3B'	(unassigned)
'04'	(unassigned)
'14'	(unassigned)
'3E'	(unassigned)
'E1'	(unassigned)
'41'	(unassigned)
'42'	POLISH L, UPPER CASE
'43'	SCANDINAVIAN O, UPPER CASE
'44'	D WITH CROSS BAR, UPPER CASE
'45'	ICELANDIC THORN, UPPER CASE
'46'	AE
'47'	OE
'48'	MAIGKIY ZNAK
'49'	DOT IN MIDDLE OF LINE
'51'	MUSICAL FLAT
'52'	SUBSCRIPT PATENT MARK
'53'	PLUS OR MINUS
'54'	(unassigned)
'55'	(unassigned)
'56'	ALIF
'57'	(unassigned)
'58'	AYN
'59'	POLISH L, LOWER CASE
'62'	SCANDINAVIAN O, LOWER CASE
'63'	D WITH CROSS BAR, LOWER CASE
'64'	ICELANDIC THORN, LOWER CASE
'65'	AE, LOWER CASE
'66'	OE, LOWER CASE
'67'	TVERDYI ZNAK
'68'	TURKISH I, LOWER CASE
'69'	BRITISH POUND SIGN
'70'	ETH

APPENDIX II.2

HEX CODE	MARC-II CHARACTER	
'71'	(unassigned)	
'72'	(unassigned)	
'73'	(unassigned)	
'74'	(unassigned)	
'75'	(unassigned)	
'76'	(unassigned)	
'77'	(unassigned)	
'78'	(unassigned)	
'80	(unassigned)	
'8A'	(unassigned)	
'8B'	(unassigned)	
'8C'	(unassigned)	
'8D'	(unassigned)	
'8E'	(unassigned)	
'8F'	(unassigned)	
'90'	(unassigned)	
'9A'	(unassigned)	
'9B'	(unassigned)	
'9C'	(unassigned)	
'9D'	(unassigned)	
'9E'	(unassigned)	
'9F'	(unassigned)	
'AO'	(unassigned)	
'AA'	(unassigned)	
'AB'	(unassigned)	
'AC'	(unassigned)	
'AD'	(unassigned)	
'AE'	(unassigned)	
'AF'	(unassigned)	
'BO'	(unassigned)	
'BI'	(unassigned)	
'B2'	(unassigned)	
'B3'	(unassigned)	
'B4'	(unassigned)	
'B5'	(unassigned)	
'B6'	(unassigned)	
'B7'	(unassigned)	
'B8'	PSEUDO QUESTION	
'B9'	GRAVE	
'BA'	ACUTE	
'BB'	CIRCUMFLEX	
'BC'	TILDE	
'BD'	MACRON	BD 5-20-69
'BE'	BREVE	
'BF'	SUPERIOR DOT	
'CA'	UMLAUT	
'CB	HACEK	
'CC'	ANGSTROM	
'CD'	LEFT LIGATURE	
'CE'	RIGHT LIGATURE	
'CF'	HIGH COMMA, DIACRITICAL	

HEX CODE	MARC-II CHARACTER
'DA'	DOUBLE ACUTE
'DB'	CANDRABINDU
'DC'	CEDILLA
'DD'	RIGHT HOOK
'DE'	DOT BELOW CHARACTER
'DF'	DOUBLE DOT BELOW CHARACTER
'EA'	CIRCLE BELOW CHARACTER
'EB'	DOUBLE UNDERSCORE
'EC'	UNDERSCORE
'ED'	LEFT HOOK
'EE'	RIGHT CEDILLA
'EF'	UPADHMANIYA
'FA'	DOUBLE TILDE, LEFT
'FB'	DOUBLE TILDE, RIGHT
'FC'	DIERESIS
'FD'	(unassigned)
'FE'	HIGH COMMA, CENTERED
'FF'	(unassigned)

Appendix 11.3 *Computer Programs Used for the MASFILE-II Project*

11.3 COMPUTER PROGRAMS USED FOR THE MASFILE-II PROJECT

I.D.	NAME	DESCRIPTION	LANGUAGE	DOCUMENTATION AVAILABLE
P-1	MCATS	Converts MASFILE I or SUNYAB tags in a file to approx. MASFILE-II tags, and formats file for ATS input	COBOL	NO
P-2	ATSLIST	Prints a list from ATS format	COBOL	NO
P-3	SUNYAB ATS Utility	Loads MARC-II (MASFILE-II) coded records into ATS	360 Assembler	NO
P-4	ATS QUEUE DUMP Utility	Transfers ATS file to Magnetic tape	(ATS Syst. Prog.)	
P-5	ATS MARC	Converts ATS record format into MASFILE-II format	COBOL	NO
P-6	Z OUT	Searches and extracts Z-class records from merged MARC-II tapes; converts MARC-II to MASFILE-II format	COBOL	NO
P-7	Z EXTRA	Extracts Z-class records from SUNYAB master file and stores them on magtape	COBOL with FORTRAN subroutine	NO
P-8	SLAUTHR	Extracts main entry up to first delimiter & places field at beginning of record for sorting	COBOL	NO
P-9	360 Utility	Sorts records from P-8 operation	360 Assembler	YES
P-10	MF STRIP	Strips off P-8 sort field after sorting so that it will not print	COBOL	NO

APPENDIX II.3

I.D.	NAME	DESCRIPTION	LANGUAGE	DOCUMENTATION AVAILABLE
P-11	MASPRNT	Prints MASFILE-II records, with wide options for field selection and formatting	COBOL	YES
P-12	NO HOLD	Adds "not checked for holdings" to "specified"	COBOL	NO
P-13	M FILE	Extracts main entry sorting field from MARC-II or MASFILE-II records	PL-I	NO

A Microfiche copy of the Masfile - II Experimental Holdings List, included in the original report, is not reproduced here. Users interested in this List should contact Five Associated University Libraries.